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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/197,767
Filing Date: November 23, 1998
Appellant(s): OHTANI ET AL.

Eric J. Robinson
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 4/22/2005 appealing from the Office action on 7/14/04.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The Brief states that there are no related appeals and interferences. However, an appeal is now pending in related application serial No. 09/550,598.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

This appeal involves claims 1-5, 16, 22-27, 40 and 46-74.

Claims 6-15, 17-21, 28-39 and 41-45 have been canceled.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on 3/17/05 has been entered.

(5) Summary of Claimed Subject Matter

The summary of invention contained in the brief is correct.

(6) Ground of Rejection to be Review on Appeal

The appellant's statement of the grounds of rejection to be review on appeal contained in the brief is correct. However, the rejection of claims 1, 2, 5, 16, 22-27, 40, 47, 48, 51, 52, 55, 56, 59, 60, 63, 64, 67, 68, 71 and 72 under 35 U.S.C. 112, first paragraph is withdrawn because the feature of a reflective pixel electrode having a flat upper surface thereon is supported in the original specification.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

U.S. 5,536,950	LIU ET AL.	7-1996
U.S. 5,706,064	FUKUNAGA ET AL.	1-1998
U.S. 6,400,428	IZUMI	6-2002
U.S. 5,644,370	MIYAWAKI ET AL.	7-1997
U.S. 6,081,305	SATO ET AL.	6-2000
U.S. 6,097,453	OKITA	8-2000
U.S. 5,990,542	YAMAZAKI	11-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 47, 51, 55, 59, 63, 67-68 and 71-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al (US. 5,536,950) in view of Fukunaga et al (US. 5,706,064) and Izumi (US. 6,400,428).

With respect to claims 1, 47, 51, 55, 59, and 63, Liu et al disclose in Fig. 4G a semiconductor device comprising: a transistor; at least one interlayer insulating film 78

formed over the transistor, the interlayer insulating film 78 having a contact hole; an embedded conductive layer 82 provided to fill the contact hole wherein a top surface of the embedded conductive layer 82 is flush with a top surface of the interlayer insulating film 78; and a pixel electrode TM2 having a flat upper surface thereon (see pixel electrode 24 in Fig. 3 and column 5, lines 37-39), and formed on the interlayer insulating film 78 wherein the pixel electrode TM2 is electrically connected to the transistor through the embedded conductive layer 82.

Liu et al do not disclose the embedded conductive layer 82 being made from the materials as claimed.

However, Fukunaga et al, in Fig. 17, teach that the embedded conductive layer 411b is made of inorganic oxide conductive layer of ITO or ZnO (column 30, lines 43-46 and column 5, lines 66-67 through column 6, lines 1-3) or made of organic conductive layer of carbon (column 20, lines 36-48) or polymer (column 26, lines 54-61). Accordingly, it would have been obvious to form Liu's embedded conductive layer with the materials as set forth above, because such materials would provide a color liquid crystal display devices having high speed response, low power consumption, and low prices, as taught by Fukunaga et al (column 3, lines 30-34). Furthermore, it also would have been obvious to form Liu's pixel electrode either as a transparent electrically conductive film or as a reflective electrical conductive film, depending upon the desired display device type for the liquid crystal display device, as taught by Izumi (column 6, lines 15-20).

With respect to claims 67-68 and 71-72, Fukunaga et al (Fig. 17) further teach the obviousness of forming an embedded conductive layer 411b comprising a same resin as the resin of the interlayer insulating film 413 (see column 19, lines 27-35 and column 42, lines 50-52), wherein the embedded conductive layer 411b comprises an

organic resin film containing a conductive material dispersed therein or an inorganic film containing a conductive material disperse therein (column 41, lines 22-32).

3. Claims 2, 22-27, 40, 48, 52, 56, 60 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al in view of Yamazaki (US. 5,990,542), Fukunaga et al and Izumi (US. 6,400,428).

With respect to claims 2, 48, 52, 56, 60, and 64, as discussed above, Fig. 4G of Liu et al substantially reads on the claimed invention, except Liu does not disclose the interlayer insulating film 78 comprising an organic resin.

However, Yamazaki teaches in Fig. 2B the obviousness of forming the interlayer insulating film 120 made of organic resin (column 5, lines 65-67). Accordingly, it would have been obvious to form the interlayer insulating film 78 of Liu et al with an organic resin, because according to Yamazaki, the interlayer insulating film made of the organic resin would suppress an electric field from the pixel electrode created later from being disturbed (column 6, lines 1-6).

Neither Liu nor Yamazaki discloses the embedded conductive layer being made from the materials as claimed.

However, Fukunaga et al, in Fig. 17, teach that the embedded conductive layer 411b is made of inorganic oxide conductive layer of ITO or ZnO (column 30, lines 43-46 and column 5, lines 66-67 through column 6, lines 1-3) or made of organic conductive layer of carbon (column 20, lines 36-48) or polymer (column 26, lines 54-61). Accordingly, it would have been obvious to form Liu's embedded conductive layer with the materials as set forth above, because such materials would provide a color liquid crystal display devices having high speed response, low power consumption, and low prices, as taught by Fukunaga et al (column 3, lines 30-34). Furthermore, it also would have been obvious to form Liu's pixel electrode either as a transparent electrically

conductive film or as a reflective electrical conductive film, depending upon the desired display device type for the liquid crystal display device, as taught by Izumi (column 6, lines 15-20).

With respect to claims 22-27 and 40, Fukunaga et al also teach in column 1, lines 5-30 that because the liquid crystal display device has high image quality and can be used as switching elements, this kind of display device has been widely used as a display device in a personal computer, television or the like. Accordingly, it would have been obvious to one ordinary skill in the art to apply the display device of Fukunaga et al specifically to a display device of a cellular phone, a camcorder, etc., in view of the broad device application disclosure in Fukunaga.

4. Claims 3, 22-27, 40, 49, 53, 57, 61, 65, 69-70, and 73-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al (US. 6,081,305) in view of Okita (US. 6,097,453), Fukunaga et al and Miyawaki et al (US. 5,644,370 - previous cited by Applicant).

With respect to claims 3, 49, 53, 57, 61, and 65, Sato et al (Fig. 2) disclose a semiconductor device comprising: a transistor; a first interlayer insulating film 130 formed over the transistor; a drain electrode 141 formed on the first interlayer insulating film and electrically connected to a drain of the transistor through an opening of the first interlayer insulating film; a second interlayer insulating film 150 formed over the drain electrode and the first insulating film; a capacitor forming electrode 165 formed on the second interlayer insulating film 150 to form a capacitor between the drain electrode 141 and the capacitor forming electrode 165; a third interlayer insulating film 170 formed over the capacitor forming electrode and the second interlayer insulating film; contact holes 171 and 151 opened through the third and second interlayer insulating films to reach the drain electrode; an embedded conductive layer filled in the contact holes; and

a reflective pixel electrode 181 is electrically connected to the drain electrode through the embedded conductive layer.

Sato et al do not disclose that the contact holes 171 and 151 are formed as a single contact hole opened through the third and second insulating films.

However, Okita teaches in Fig. 6 the obviousness of forming a single contact hole 508 opened through the third insulating film 109 and second insulating film 601 to reach the drain electrode 108. Accordingly, it would have been obvious to modify the contact holes 171 and 151 of Sato et al by forming a single contact hole, because as is well known, the forming of a single contact hole as taught by Okita would reduce the number of steps in fabricating process.

Neither Sato nor Okita discloses the embedded conductive layer being made from the materials as claimed.

However, Fukunaga et al, in Fig. 24, teach that the embedded conductive layer 418 is made of inorganic oxide conductive layer of ITO or ZnO (column 30, lines 43-46 and column 5, lines 66-67 through column 6, lines 1-3) or made of organic conductive layer of carbon (column 20, lines 36-48) or polymer (column 26, lines 54-61). Accordingly, it would have been obvious to form Sato's embedded conductive layer with the materials as set forth above, because such materials would provide a color liquid crystal display devices having high speed response, low power consumption, and low prices, as taught by Fukunaga et al (column 3, lines 30-34). Fukunaga's Fig. 24 further teaches the forming of tapered opening because such tapered opening would provide the good connections between the source/drain region and the pixel electrode, as taught by Miyawaki (see Fig. 9 and column 10, lines 11-21).

With respect to claims 22-27 and 40, Fukunaga et al also teach in column 1, lines 5-30 that because the liquid crystal display device has high image quality and can be

used as switching elements, this kind of display device has been widely used as a display device in a personal computer, television or the like. Accordingly, it would have been obvious to one ordinary skill in the art to apply the display device of Fukunaga et al specifically to a display device of a cellular phone, a camcorder, etc., in view of the broad device application disclosure in Fukunaga.

With respect to claims 69-70 and 73-74, Fukunaga et al (Fig. 17) further teach the obviousness of forming an embedded conductive layer 411b comprising a same resin as the resin of the interlayer insulating film 413 (see column 19, lines 27-35 and column 42, lines 50-52), wherein the embedded conductive layer 411b comprises an organic resin film containing a conductive material dispersed therein or an inorganic film containing a conductive material disperse therein (column 41, lines 22-32).

5. Claims 4 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al in view of Okita, Miyawaki et al and Yamazaki (US. 5,990,542).

As discussed in details above, the combination of Sato et al, Okita and Miyawaki substantially reads on the claimed invention, including the known feature of forming a material normally used for the electrode (i.e., pixel electrode) in the semiconductor and TFT processes, such as aluminum (as taught by Okita, in column 6, lines 15-19).

The above combination does not disclose the third interlayer insulating film comprising an organic resin.

However, Yamazaki teaches in Fig. 2B the obviousness of forming the ITO pixel electrode on the interlayer insulating film 120 made of organic resin (column 5, lines 65-67). Accordingly, it would have been obvious to form the interlayer insulating film 170 of Sato et al with an organic resin, because according to Yamazaki, the interlayer insulating film made of the organic resin would suppress an electric field from the pixel electrode created later from being disturbed (column 6, lines 1-6).

6. Claims 54, 58, 62 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al, Okita, Miyawaki et al and Yamazaki as applied to claim (4,50) above, and further in view of Fukunaga et al.

None of the above references discloses the embedded conductive layer being made from the materials as claimed.

However, Fukunaga et al, in Fig. 17, teach that the embedded conductive layer 411b is made of inorganic oxide conductive layer of ITO or ZnO (column 30, lines 43-46 and column 5, lines 66-67 through column 6, lines 1-3) or made of organic conductive layer of carbon (column 20, lines 36-38) or polymer (column 26, lines 54-61). Accordingly, it would have been obvious to form Sato's embedded conductive layer with the materials as set forth above, because such materials would provide a color liquid crystal display device having high speed response, low power consumption, and low prices, as taught by Fukunaga et al (column 3, lines 30-34).

7. Claims 5, 16, 22-27, 40 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al in view of Fukunaga et al (US. 5,706,064) and Izumi (US. 6,400,428).

With respect to claims 5 and 46, as discussed above, Fig. 4G of Liu et al substantially reads on the claimed invention, except it does not disclose that the embedded conductive layer comprises a same resin as the resin of the interlayer insulating film.

However, Fukunaga et al (Fig. 17) teach the forming an embedded conductive layer 411b comprising a same resin as the resin of the interlayer insulating film 413 (see column 19, lines 27-35 and column 42, lines 50-52), wherein the embedded conductive layer 411b comprises an organic resin film containing a conductive material dispersed

therein or an inorganic film containing a conductive material disperse therein (column 41, lines 22-32). Accordingly, it would have been obvious to form the embedded conductive layer and the interlayer insulating film with the resin as set forth above, in order to provide a substrate for a display device which can be used in liquid crystal in a high speed response mode and achieves a low price, such as taught by Fukunaga et al (column 1, lines 55-59). Furthermore, it also would have been obvious to form Liu's pixel electrode being either a transparent electrically conductive film or a reflective electrical conductive film depending upon the display device type which is desired for the liquid crystal display device, as taught by Izumi (column 6, lines 15-20).

With respect to claim 16, the discussions of the combination of Liu, Fukunaga and Izumi in conjunction with rejection of independent claim 1 are herein incorporated by reference. Fukunaga et al further teach that the embedded conductive layer 411b is made of inorganic oxide conductive layer of ITO or ZnO (column 30, lines 43-46 and column 5, lines 66-67 through column 6, lines 1-3) or made of organic conductive layer of carbon (column 20, lines 36-48) or polymer (column 26, lines 54-61), and one of the two conductive layers is in contact with an alignment film 517 (number 517 not shown in Fig. 17, see Fig. 27).

With respect to claims 22-27 and 40, Fukunaga et al also teach in column 1, lines 5-30 that because the liquid crystal display device has high image quality and can be used as switching elements, this kind of display device has been widely used as a display device in a personal computer, television or the like. Accordingly, it would have been obvious to one ordinary skill in the art to apply the display device of Fukunaga et al specifically to a display device of a cellular phone, a camcorder, etc., in view of the broad device application disclosure in Fukunaga.

8. Claims 1-2, 5, 22-27, 40, 47-48, 51-52, 55-56, 59-60, 63-64, 67-68 and 71-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukunaga et al (US. 5,706,064) in view of Liu et al (US. 5,536,950) and Izumi (US. 6,400,428).

With respect to claims 1-2, 5, 47-48, 51-52, 55-56, 59-60,63-64, 67-68 and 71-72, Fukunaga (Figs. 24A - 24G) discloses a semiconductor device having an active matrix display device, comprising: forming a first conductive layer 405; forming an insulating layer (413,414) over the first conductive layer; forming an opening in the insulating layer to expose the first conductive layer 405 at a bottom of the opening; forming an embedded conductive layer 418 to cover the insulating layer and the opening (Fig. 24E); etching the embedded conductive layer 418 (Fig. 24F); and forming a second conductive layer on the insulating layer and the embedded conductive layer; and forming a light pixel electrode 412 by patterning the second conductive layer (column 26, lines 46-48); wherein the pixel electrode 412 is electrically connected to the transistor through the embedded conductive layer 418 or 411b, wherein the embedded conductive layer 418 or 411b comprises an organic resin film made of polymer (column 26, lines 54-61) or carbon (column 20, lines 36-48) which is the same resin as the resin of the interlayer insulating film (column 19, lines 27-35 and column 20, lines 31-57), and wherein the embedded conductive layer 418 or 411b is further made of inorganic oxide conductive layer of ITO or ZnO (column 30, lines 43-46 and column 5, lines 66-67 through column 6, lines 1-3).

Fukunaga does not disclose the top surface of the embedded conductive layer being flush with the top surface of the interlayer insulating film.

However, Liu (Fig. 4G) teaches the steps of depositing the embedded conductive layer 82 in the opening, followed by planarization to flush the top surface of the embedded conductive layer with the top surface of the interlayer insulating film 78, and

depositing and patterning the pixel electrode 24 having a flat upper surface thereon (also see Fig. 3) on the embedded conductive layer 82 (column 5, lines 30-39). Accordingly, it would have been obvious to form the embedded conductive layer 418 of Fukunaga being flush with the top surface of the interlayer insulating film in order to provide a unique body tie arrangement for achieving a compact and high reliability display, as taught by Liu (column 2, lines 57-67 through column 3, lines 1-12). Furthermore, it also would have been obvious to form Fukunaga's pixel electrode either as a transparent electrically conductive film or as a reflective electrical conductive film, depending upon the desired display device type for the liquid crystal display device, as taught by Izumi (column 6, lines 15-20).

With respect to claims 22-27 and 40, Fukunaga also teaches that because the liquid crystal display device has high image quality and can be used as switching elements, this kind of display has been widely used as a display device in a personal computer, television or the like. Accordingly, it would have been obvious to apply the display device of Fukunaga to a cellular phone, a camcorder, etc., in view of the broad device application disclosure in Fukunaga.

(10) Response to Argument

<u>Issue No. 1</u>: <u>Claims 1, 2, 5, 16, 22-27, 40, 47, 48, 51, 52, 55, 56, 59, 60, 63, 64, 67, 68, 71 and 72 are rejected under 35 U.S.C. 112, first paragraph</u>

The rejection of claims 1, 2, 5, 16, 22-27, 40, 47, 48, 51, 52, 55, 56, 59, 60, 63, 64, 67, 68, 71 and 72 under 35 U.S.C. 112, first paragraph, is withdrawn because the feature of forming a reflective pixel electrode having a flat upper surface thereon is supported in the original specification.

Issue No. 2:

Claims 1, 2, 5, 16, 22-27, 40, 46-48, 51, 52, 55, 56, 59, 60, 63, 64, 67, 68, 71 and 72 are rejected as being unpatentable over Liu et al in view of Fukunaga et al and Izumi

Claims 2, 22-27, 40, 48, 52, 56, 60 and 64 are rejected as being unpatentable over Liu et al in view of Yamazaki, Fukunaga et al and Izumi

Appellant (pages 6-10 of Brief) argues that even though Izumi teaches the use of a transparent pixel electrode for a light transmitting type display device and the use of a reflective pixel electrode for a reflective type display device, it would not be obvious to change Liu's device from a transmitting type display device to a reflective type display device by replacing Liu's transparent pixel electrode with the reflective pixel electrode.

These arguments are not persuasive because of the following reasons:

First, it appears that Appellant has misinterpreted the teachings of the references based on the combination of Liu and Izumi. Izumi does not teach the changing of a reflective pixel electrode into the transmitting type LCD device as asserted by Appellant, but rather, Izumi (Fig. 3) teaches the forming of a single generic LCD substrate panel which can be used for either transmitting type LCD device or a reflective type LCD device by choosing the appropriate material of the pixel electrode for the LCD substrate panel. As taught by Izumi's Fig. 3, the single LCD substrate panel 10, including a matrix of transistors 16 and their associated pixel electrodes 15, can be used as a transmitting LCD substrate panel in a transmitting type LCD device by using a transparent conductive film for the pixel electrode 15. It also can be used as

a reflective LCD substrate panel in a reflective type LCD device by using a reflective conductive film for the pixel electrode 15. Specifically, Izumi states in column 6, lines 14-19 that:

> "Each pixel electrode 15 is a transparent electrically conductive film made of ITO (Indium Tin Oxide) or the like when used for a light transmitting type display device and a reflective electrically conductive film made of aluminum (Al) or the like when used for a reflecting type display device."

It is noted that Liu (Fig. 1) also discloses an LCD substrate Panel 10 that is equivalent to the LCD substrate panel 10 of Izumi's Fig. 3. The LCD substrate panel 10 of Liu includes a matrix of transistors 22 and their associated pixel electrodes 24 (also see Fig. 3 and Fig. 4G for sectional views of LCD substrate panel 10). Therefore, in view of teachings of Izumi (as discussed above), the LCD panel 10 of Liu can be used as a transmitting LCD substrate panel or as a reflective LCD substrate panel for either transmitting type LCD device or reflective type LCD device, respectively. In other words, the LCD substrate panel 10 of Liu is not used only for the transmitting type LCD device; alternatively the LCD substrate panel 10 of Liu can be used for the reflective type LCD device by using a reflective conductive film for the pixel electrode as suggested by Izumi. Thus, using the LCD substrate panel suggested from the combination of Liu and Fukunaga, within the meaning of 35 U.S.C. 103, for either the reflective type LCD device or the transmitting type LCD device would have been obvious because it would depend upon the conductive material type which is used for the panel pixel electrode, as taught by Izumi.

Second, the examiner specifically notes the following admission at page 31, lines 15-25 of **Appellant's specification**:

> "**While an AMLCD driven in a reflection mode** is exemplified in Examples 1 to 9, **the invention can be applied to an AMLCD driven in a transmission mode ... In order to produce a transmission type AMLCD, a transparent conductive film** (typically an ITO film and a tin oxide film) **is used as the pixel electrode.**" [Emphasis added].

This Appellant's admission appears to support the contention in this Answer that The LCD substrate panel 10 of Liu can be used as either in the transmitting LCD mode or in the reflective LCD mode, depending upon the conductive material type used for the panel pixel electrode.

Third, It is not controverted that the LCD substrate panel disclosed in instant Fig. 5C can be used as a reflective LCD substrate panel or as a transmitting LCD substrate panel, depending upon the material which is used for the pixel electrode of the LCD substrate panel (see Appellant's specification, page 31, lines 15-25). However, it is unclear why the Appellant's LCD panel can be used in both reflective type LCD device and transmitting type LCD device, while the LCD substrate panel disclosed by Liu cannot.

Appellant (page 11 of Brief) also argues that Fukunaga and Yamazaki do not teach or suggest that it would have been obvious to change the transmitting LCD substrate panel of Liu into a reflective LCD substrate panel.

This argument is not persuasive because Fukunaga and Yamazaki are not relied on for teaching the changing of the transmitting LCD substrate panel of Liu into a

reflective LCD substrate panel, but rather, Izumi is relied on for teaching the changing of the transmitting LCD substrate panel of Liu into a reflective LCD substrate panel (see discussions above).

Appellant (page 11 of Brief) further argues that with respect to independent claim 5, none of the applied references teach or suggest that an embedded conductive layer comprises a same resin as a resin of an interlayer insulating film.

The Examiner disagrees. As clearly stated in ground of rejection, Fukunaga does teach the forming an embedded conductive layer comprising a same resin material as the resin material of the insulating film 413/414. Specifically, Fukunaga states at column 19, lines 27-29:

> **"On the TFT and Cs line thus formed, functional layers 413, 411a, 411b, and 414 made of organic-inorganic hybrid glass are formed";**

and at column 20, lines 35-57:

> "Further the substrate is subjected to pre-baking at 100 C. for 10 minutes. After baking, **<u>the portions 411a and 411b are black and have conductivity property</u> ...** subsequently, this is subjected to post-baking at 250 C for 60 minutes. After the baking, **<u>the black matrix portion 414 is black and has an insulating property</u>.**" [Emphasis added].

Therefore, In contrary to Appellant's assertion, Fukunaga does suggest the forming an embedded conductive layer 411a/411b in the insulating film 413/414, and the embedded conductive layer 411a/411b having the same material as the material of the insulating film 413/414.

<u>Issue No. 3</u>: <u>Claims 3, 4, 22-27, 40, 49, 50, 53, 54, 57, 58, 61, 62, 65, 66, 69, 70, 73 and 74 as being unpatentable over the combination of Sato et al, Okita, and one or more of Fukunaga, Miyawaki et al and Yamazaki</u>

Appellant (page 12 of Brief) asserts that "dependent claim 16 is dependent upon claims 1 and 47-50. it appears that claim 16 as it depends from claims 1, 47 and 48 stands rejected based on the above-referenced rejections. However, it does not appear that claim 16 as it depends from claim 49 and 50 is formally rejected. Therefore, in addition to the reasons stated above, dependent claim 16 as it depends from claims 49 and 50 is believed to be in condition for allowance."

Appellant is incorrect because dependent claim 16 is dependent upon "**any one** of claims 1 and 47-50". The examiner agrees with Appellant that dependent claim 16 as it depends from claims 1, 47 and 48 stands rejected based on the combination of Liu, Fukunaga and Izumi (the discussions of the combination of Liu, Fukunaga and Izumi in conjunction with rejection of independent claims 1 and 47 are herein incorporated by references). Therefore, dependent claim 16 has been rejected, and rejected dependent claim 16 is not required to rejected again although it also depends from clams 49 and 50. Thus, rejected dependent claim 16 is not allowable dependent claim as asserted by Appellant.

Appellant (pages 12-14 of Brief) argues that it would not be obvious to combine the other applied references with Sato because Sato does not teach the embedded conductive layer being formed as distinct from the pixel electrode.

This argument is not persuasive because of the following reasons:

First, it appears that the feature of forming the embedded conductive layer being formed as distinct from the pixel electrode does not seem to be required by the claim language. However, in contrary to Appellant's assertions, Fig. 2 of Sato does disclose the embedded conductive layer being formed as distinct from the pixel electrode. Specifically, in Fig. 2, Sato labels "an embedded conductive layer" filled in the contact hole as a reference number "171", and "a reflective pixel electrode" formed on the third interlayer insulating film 170 as a reference number "181". Therefore, Sato's Fig. 2 clearly suggests the invention as claimed.

Second, it appears that Appellant argues that the embedded conductive layer 171 is not formed as distinct from the reflective pixel electrode 181 because the embedded conductive layer 171 and the reflective pixel electrode 181 are not formed in different steps. Again, the process forming of the embedded conductive layer and the pixel electrode in different steps is not required by the claim language. It is noted that these claims are directed to the product, no matter how it is actually made, and the patentability of the final product must be determined, not the patentability of the process, which in any case have not been presented in "product by process" claims. In this case, the examiner recognizes that the embedded conductive layer and the pixel electrode in the final structure as claimed do not distinguish from the embedded conductive layer 171 and the pixel electrode 181 as suggested by Sato's Fig. 2. Therefore, the Examiner respectfully submits that Appellant has failed to point out the differences between the final structure of the embedded conductive layer and the pixel

electrode as claimed and the final structure of the embedded conductive layer and the pixel electrode as suggested by Sato.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

(12) Evidence Appendix

The Brief does not contain an Evidence appendix. However, there is no evidence of record pursuant to 37 CFR sections. 1.130, 1.131, 1.132.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

PC
June 2, 2005

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